WHAT IS CLAIMED IS:

1.   A rotary electric machine comprising a stator having a stator core wounded with stator windings; and a rotor having a rotor core rotatable and opposite to said stator

5   core through a gap, wherein

said rotor core comprises a plurality of projecting poles arranged in a side of said gap and along the circumferential direction; and a plurality of rotor yokes for forming a magnetic path conducting magnetic fluxes of

10   each of said projecting poles, and said rotor core is divided in the circumferential direction in a unit of each of said projecting poles and each of said rotor yokes opposite to each of said projecting poles.

15   2.   A rotary electric machine according to claim 1, wherein a position of said division is at each middle position of width in the circumferential direction of said projecting poles.

20   3.   A rotary electric machine comprising a stator having a stator core wounded with stator windings; and a rotor having a rotor core rotatable and opposite to said stator core through a gap, wherein

said rotor core comprises a plurality of permanent

25   magnets arranged and embeded therein in a side of said gap and along the circumferential direction; and a plurality of rotor yokes for forming a magnetic path conducting magnetic

fluxes of each of said permanent magnets, and said rotor core is divided in the circumferential direction in a unit of each pole of said permanent magnets and each of said rotor yokes opposite to each pole of said permanent magnets.

4. A rotary electric machine according to claim 3, wherein a position of said division is at each position between the poles of said permanent magnets.

5. A rotary electric machine according to any one of claim 1 and claim 3, wherein said rotor core is made of a different material from a material of said stator core.

6. An electric vehicle comprising a battery for supplying electric power; a rotary electric machine for outputting drive torque to drive the vehicle by said supplied electric power; and a controller for controlling said drive torque, wherein

said rotary electric machine comprises a stator having a stator core wounded with stator windings; and a rotor having a rotor core rotatable and opposite to said stator core through a gap, and said rotor is formed of a rotor core divided in the circumferential direction in a unit of each magnetic pole and a holding member having an I-shaped cross section for holding said rotor core, said holding member having an I-shaped cross section being disposed an inner peripheral side of said rotor core in

order to lengthen a driving distance per charge of said vehicle by reducing the vehicle weight.

7. A permanent magnet rotary electric machine comprising
5   a stator having a stator core wounded with stator windings; and a rotor having a rotor core opposite to said stator core through a rotation gap, a plurality of permanent magnets being arranged and embeded in said rotor core in the circumferential direction, wherein
10   the following relation is satisfied,

$r/w \fallingdotseq 0.6 \pm 0.1,$

where r is a distance in a radial direction from an inner radial surface of said rotor core to a side end portion between poles of an inner peripheral surface of each of
15 said permanent magnets, and $2 \cdot w$ is a length in the circumferential direction of said permanent magnet.

8. A permanent magnet rotary electric machine comprising a stator having a stator core wounded with stator windings;
20 and a rotor having a rotor core opposite to said stator core through a rotation gap, a plurality of permanent magnets being arranged and embeded in said rotor core in the circumferential direction, said rotor core having a plurality of die-cut holes in the circumferential direction
25 between an inner radial surface of said rotor core and an inner peripheral surface of said permanent magnets, wherein the following relation is satisfied,

$t/w \fallingdotseq 0.6$,

where t is a distance in a radial direction from said permanent magnet side of each of said die-cut holes to a side end portion between poles of an inner peripheral

5 surface of each of said permanent magnets, and $2 \cdot w$ is a length in the circumferential direction of said permanent magnet.